

Quaternary Fault and Fold Database of the United States

As of January 12, 2017, the USGS maintains a limited number of metadata fields that characterize the Quaternary faults and folds of the United States. For the most up-to-date information, please refer to the [interactive fault map](#).

unnamed Catlow Valley faults, Catlow Valley section (Class A) No. 824a

Last Review Date: 2016-03-25

citation for this record: Personius, S.F., and Haller, K.M., compilers, 2016, Fault number 824a, unnamed Catlow Valley faults, Catlow Valley section, in Quaternary fault and fold database of the United States: U.S. Geological Survey website, <https://earthquakes.usgs.gov/hazards/qfaults>, accessed 12/14/2020 01:58 PM.

Synopsis	<p>General: The unnamed Catlow Valley faults are marked by prominent, up to 0.5-high escarpments that separate the eastern margin of Catlow Valley from the west flanks of Steens Mountain and the Pueblo Mountains and the western margin of the Hawksy Walksy Valley to the southwest. No fault scarps on Quaternary deposits have been described along the fault traces.</p> <p>Sections: This fault has 2 sections. The Catlow Valley section is a down-to-the-west normal fault that forms the eastern margin of the Catlow Valley; the Hawksy Walksy Valley section is a down-to-the-east normal fault that forms the western margin of the Hawksy Walksy Valley.</p>
Name comments	<p>General: These faults were mapped in the Catlow and Hawksy Walksy valleys by Walker and Repenning (1965 #3559) and Walker and MacLeod (1991 #3646). Pezzopane (1993 #3544), Geomatrix Consultants, Inc. (1995 #3593), Madin and Mabey (1996 #3575), and Weldon and others (2002 #5648) include these faults in</p>

	compilations of Quaternary faults in Oregon. Hopkins and Dawers (2016 #7372) the name Cutlow Valley fault to refer to the fault bounding Cutlow Valley.
County(s) and State(s)	HARNEY COUNTY, OREGON
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. <i>Comments:</i> Location of fault from ORActiveFaults (http://www.oregongeology.org/arcgis/rest/services/Public/ORActiveFaults/MapServer downloaded 06/02/2016) attributed to 1:100,000-scale mapping of Evans and Gearty (2001 #7801) and 1:250,000-scale mapping of Walker and Repenning (1965 #3559) supplemented with 1:100,000-scale mapping of Weldon and others (2002 #5648)
Geologic setting	These north-trending normal faults lie near the northern boundary of the Basin and Range province in southeastern Oregon. They form the eastern margin of the Catlow Valley and the western margin of the Hawkswalk Valley. The area is underlain by Miocene volcanic rocks (Walker and Repenning, 1965 #3559; Walker and MacLeod, 1991 #3646).
Length (km)	This section is 56 km of a total fault length of 77 km.
Average strike	N2°W (for section) versus N0°E (for whole fault)
Sense of movement	Normal <i>Comments:</i> This fault is mapped as a normal or high-angle fault by Walker and Repenning (1965 #3559), Walker and MacLeod (1991 #3646), and Pezzopane (1991 #3544).
Dip Direction	W
Paleoseismology studies	
Geomorphic expression	The Catlow Valley section is marked by a prominent, 150- to more than 500-m-high escarpment (the Catlow Rim) that separates the eastern margin of Catlow Valley from the west flanks of Steens Mountain and the Pueblo Mountains (Trench and others 2012 #7373); the bedrock that underlies these highlands primarily consists of Miocene basalt and andesite (Walker and Repenning, 1965 #3559; Vander Meulen and others 1989 #3500, 1989 #3501; Walker and MacLeod, 1991 #3646). No fault scarps on Quaternary deposits have been described along the fault trace, although Weldon and others (2002 #5648) describe lineaments across Quaternary deposits on 1:100,000

	scale DEMs of the fault trace.
Age of faulted surficial deposits	The Catlow Valley section forms prominent escarpments in Miocene Steens Basalt. These rocks have radiometric ages of 15–17 Ma (Sherrod and Johnson, 1994 #356). In some places, bedrock is mapped as juxtaposed against Pliocene or Pleistocene lacustrine fluvial sediments (Walker and Repenning, 1965 #3559; Walker and MacLeod, 1965 #3646), but no fault scarps on Quaternary deposits have been reported along the fault trace.
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) <i>Comments:</i> Pezzopane (1993 #3544) used airphoto analysis to infer Quaternary (<1.6 Ma) displacement on the Catlow Valley section, and subsequent compilations (Geomatrix Consultants Inc., 1995 #3593; Madin and others, 1996 #3479; Madin and Mabey, 1996 #3575; Weldon and others, 2002 #5648) also show the fault as active during the Quaternary (<1.6–1.8 Ma). Hopkins and Dawers (2016 #7372) study of breached Catlow Valley fault relay ramps suggest post-pluvial (less than 10–20 ka) deformation resulting in local changes in shoreline elevation compared to the average. The age category of Quaternary is retained regardless of Hopkins and Dawers (2016 #7372) interpretation to the contrary because fault scarps are not observed anywhere, even above the highest shoreline.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr <i>Comments:</i> No published slip rates are available for the Catlow Valley section. However, movement on the fault has produced a 0.5-km-high escarpment along the central part of the fault in 15–17 Ma volcanic rocks. Such data indicate low rates of long-term slip.
Date and Compiler(s)	2016 Stephen F. Personius, U.S. Geological Survey Kathleen M. Haller, U.S. Geological Survey
References	#7801 Evans, J.G., and Geisler, T.M., 2001, Geologic field-trip guide to Steens Mountain Loop Road, Harney County, Oregon: U.S. Geological Survey Bulletin 15 p., 1 pl., 1:100,000 scale. #3593 Geomatrix Consultants, Inc., 1995, Seismic design mapping, State of Oregon. Technical report to Oregon Department of Transportation, Salem, Oregon, under Contract 11688, January 1995, unpaginated, 5 pls., scale 1:1,250,000.

- #7372 Hopkins, M.C., and Dawers, N.H., 2016, Vertical deformation of lacustrine shorelines along breached relay ramps, Catlow Valley fault, southeastern Oregon. USA: *Tectonophysics*, v. 674, p. 89–100, doi:10.1016/j.tecto.2016.02.015
- #3575 Madin, I.P., and Mabey, M.A., 1996, Earthquake hazard maps for Oregon: of Oregon, Department of Geology and Mineral Industries Geological Map Series GMS-100, 1 sheet.
- #3479 Madin, I.P., Ferns, M.F., Langridge, R., Jellinek, A.M., and Priebe, K., 1995, Final report to Bonneville Power Administration U.S. Department of Energy Portland General Electric Company—Geothermal resources of southeast Oregon: State of Oregon, Department of Geology and Mineral Industries Open-File Report OFR-04, 41 p., 6 pls.
- #3544 Pezzopane, S.K., 1993, Active faults and earthquake ground motions in Oregon, Eugene, Oregon, University of Oregon, unpublished Ph.D. dissertation, 208 p.
- #3563 Sherrod, D.R., and Johnson, J.A., 1994, Geologic map of the Irish Lake quadrangle, Harney County, south-central Oregon: U.S. Geological Survey Miscellaneous Field Studies Map MF-2256, 1 sheet, scale 1:24,000.
- #7373 Trench, D., Meigs, A., Grunder, A., 2012, Termination of the northwestern Basin and Range province into a clockwise rotating region of transtension and volcanism, southeastern Oregon: *Journal of Structural Geology*, v. 39, p. 52–65, doi:10.1016/j.jsg.2012.03.007.
- #3500 Vander Meulen, D.B., Griscom, A., King, H.D., Vercoutere, T.L., and Moy P.R., 1989, Mineral resources of the Home Creek Wilderness study area, Harney County, Oregon: U.S. Geological Survey Bulletin 1740, 12 p.
- #3501 Vander Meulen, D.B., Plouff, D., King, H.D., Mayerle, R.T., and Rains, R., 1989, Mineral resources of the Rincon Wilderness study area, Harney County, Oregon: U.S. Geological Survey Bulletin 1740, 14 p.
- #3646 Walker, G.W., and MacLeod, N.S., 1991, Geologic map of Oregon: U.S. Geological Survey, Special Geologic Map, 2 sheets, scale 1:500,000.
- #3559 Walker, G.W., and Repenning, C.A., 1965, Reconnaissance geologic map of the Adel quadrangle, Lake, Harney, and Malheur Counties, Oregon: U.S. Geological Survey Miscellaneous Geologic Investigations I-446, 1 sheet, scale 1:250,000.
- #5648 Weldon, R.J., Fletcher, D.K., Weldon, E.M., Scharer, K.M., and McCrory, 2002, An update of Quaternary faults of central and eastern Oregon: U.S. Geological Survey Open-File Report 02-301 (CD-ROM), 26 sheets, scale 1:100,000.

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